

the primary division of the order should be neither into ORTHORRHAPHIA and CYCLORRHAPHIA, nor into NEMATOCERA and BRACHYCERA, but into POLYNEURA and OLIGONEURA, the former including, in addition to the Tipulid-Culicid group of the NEMATOCERA, the whole of the CYCLORRHAPHIA and the ORTHORRHAPHIA BRACHYCERA.

V.—Notes on *Fossorial Hymenoptera*.—XIX. On new Species from Australia. By ROWLAND E. TURNER, F.Z.S., F.E.S.

Family Mutillidæ.

Ephutomorpha submetallescens, sp. n.

♀. Cærulescens; abdomine pedibusque cupreo-purpureis; antennis nigris; mandibulis nigris, basi ferrugineis; segmentis dorsalibus 1-5 macula apicali albo-hirta.

Long. 12 mm.

♀. Head distinctly narrower than the thorax, closely and rather coarsely punctured, not much narrowed behind the eyes, rather strongly rounded posteriorly; eyes large, as near to the posterior margin of the head as to the base of the mandibles; antennal tubercles well developed, second joint of the flagellum as long as the first and third combined. Thorax very coarsely reticulate, nearly twice as long as the greatest breadth, a little broader in the middle than on the anterior margin, the apical third rather strongly narrowed. Abdomen closely punctured, the punctures on the second dorsal segment larger than on the others and more or less confluent; first segment oblique from near the apex to the base, slightly constricted at the apex, with a spine on each side at the base beneath and with a small patch of white hairs at the apex; second dorsal segment very long, more than half as long again as the greatest breadth, narrower at the extremities. No pygidial area. The sides of the apical segments clothed with long black hairs. Intermediate and hind tibiæ without spines on the outer margin. Calcaria white, the outer apical angle of the tibiæ produced into two short spines much less than half the length of the calcaria.

Hab. Brisbane (*Hacker*); February.

This is very nearly related to *E. metallica*, Sm., but

differs in the absence of a longitudinal depression on the basal half of the second dorsal segment, in the greater breadth of the thorax, which is more than twice as long as the greatest breadth in *metallica*, and in the greater length of the second dorsal segment. The colour of the thorax is also different. The type of *metallica* is from Adelaide, but the species ranges as far west as Perth.

Ephutomorpha dilecta, sp. n.

♀. Cærulea, abdomine viridi-cæneo; antennis mandibulisque nigris; pedibus fuscis, femoribus intermediis posticisque basi, tibiisque posticis supra ferrugineis.

Long. 10 mm.

♀. Head no broader than the thorax, closely and not very finely punctured, not narrowed behind the eyes, the posterior angles very feebly rounded; eyes large, a little nearer to the posterior margin of the head than to the base of the mandibles; antennal tubercles well developed; second joint of the flagellum as long as the first and third combined. Thorax nearly twice as long as the breadth on the almost straight anterior margin, strongly narrowed from behind the middle; coarsely reticulate. Abdomen closely and finely punctured; first segment oblique from near the apex to the base, slightly constricted at the apex, with a spine on each side at the base beneath; second segment about half as long again as the greatest breadth, not much broader in the middle than at the apex, more strongly punctured than the other segments, a small patch of white hairs at the apex of segments 2-5. No pygidial area. The sides of the apical segments clothed with long black hairs. Intermediate and hind tibiæ with one well-developed spine near the middle of the outer margin, the apex of the tibiæ above produced into two spines nearly as long as the calcaria, which are black.

Hab. Brisbane (*Ilacker*); June.

In many points this is related to *submetallescens*, but differs in the armature of the tibiæ, in colour, and in the shorter second abdominal segment. It is quite distinct from *amana*, André, and other metallic species from North Queensland.

Family Thynnidæ.

Zaspilothynnus excavatus, Turn.

Thynnus excavatus, Turn. Proc. Linn. Soc. N.S.W. xxxiii. p. 216 (1908). ♂ ♀.

Zaspilothynnus excavatus, Turn. Wystman's Gen. Insect. cv. p. 53 (1910).

The typical form is from Kuranda, North Queensland. A pair sent from the Queensland Museum differ in colour from the typical form, the male having the four apical dorsal segments of the abdomen wholly ferruginous red, whereas the Kuranda specimens have the same segments brownish yellow more or less marked with black, the fourth segment being often wholly black. The female has the abdomen more strongly marked with yellow than in the type, but Kuranda specimens vary much in this respect and in one specimen the yellow markings are almost as large as in the Brisbane form. The only structural differences are the slightly shorter hypopygium of the male, and the slightly narrower head of the female in the Brisbane form. These differences may prove to be of subspecific value.

Tmesothymus ingrediens, sp. n.

♂. Niger; clypeo linea marginali utrinque, mandibulis basi, macula obliqua utrinque inter antennis, pronoto linea transversa utrinque antice, postscutelloque albido-flavis; alis hyalinis, venis nigris.

♀. Brunco-ferruginea; segmento mediano nigro; segmentis abdominalibus tertio, quarto quintoque plus minus infuscatis; segmento dorsali secundo transverse quadricarinato.

Long., ♂ 9 mm., ♀ 6 mm.

♂. Head and thorax closely and rather finely punctured, abdomen more sparsely punctured, median segment shining, very minutely punctured. Clypeus truncate at the apex; antennæ about as long as the thorax and median segment combined, of even thickness throughout, the prominence between the antennæ almost obsolete. Head very thin and flat. Anterior margin of the pronotum straight and slightly raised, median segment rounded. Abdominal segments strongly constricted at the base, the seventh dorsal segment very broadly rounded at the apex. Hypopygium with parallel sides, broadly and shallowly emarginate at the apex, with a long apical spine. Second abscissa of the radius longer than the third, second recurrent nervure received at about one-tenth from the base of the third cubital cell.

♀. Head broader than long by about one-third, the sides slightly sinuate in the middle; eyes small, oblique, narrowly ovate, nearly touching the base of the mandibles; front sparsely punctured, without a sulcus, vertex almost smooth; mandibles long and falcate, not toothed. Pronotum finely punctured, much broader than long, distinctly narrowed posteriorly, the anterior angles prominent; scutellum broader

than long, broadly rounded at the apex; median segment rather closely punctured, the dorsal surface a little longer than the scutellum and not divided from the oblique posterior slope. Abdomen shining, microscopically punctured, with a few larger punctures near the apex of the third, fourth, and fifth segments; first dorsal segment rather strongly depressed on the apical margin; second with four strong transverse carinæ, including the raised apical margin; pygidium narrowly elongate-ovate, pointed at the base, the sides forming marginal carinæ. Fifth ventral segment closely and deeply punctured at the apex.

Hab. Brisbane (*Hacker*); April and September.

This is near *T. iridipennis*, Sm., but has the clypeus much less strongly convex in the male. According to Smith the female of *iridipennis* has only two transverse carinæ on the second segment, and the male hypopygium is truncate, not emarginate.

Unfortunately the types are lost, having been in the Bakewell collection.

Epactiothynnus multicolor, sp. n.

♂. Rufo-ferrugineus; antennis, fronte ante ocellos, pronoto in medio, mesosterno segmentoque mediano nigris; mandibulis, clypeo, orbitis internis, macula bilobata inter antennis, pronoto margine anteriore et posteriore, tegulis, postscutello, segmento mediano macula magna curvata apicali utrinque, segmentisque dorsalibus quinque basalibus macula parva utrinque flavis; alis hyalinis, venis nigris.

Long. 8 mm.

♂. Clypeus scarcely convex, rather broadly truncate at the apex. Antennæ nearly as long as the head, thorax, and median segment combined, slender, the apical joints a little narrowed; the interantennal prominence almost obsolete. Head and thorax finely and closely punctured; the pronotum short, slightly emarginate anteriorly. Median segment shining and almost smooth; abdomen slender, sparsely and shallowly punctured, the segments constricted at the base. Seventh dorsal segment more coarsely punctured; hypopygium with a long apical spine, narrowed from the base, with a small spine on each side at the base. Second abscissa of the radius a little shorter than the third, second recurrent nervure received at about one-fifth from the base of the third cubital cell.

Hab. Oxley, near Brisbane (*Hacker*); September.

This is the eastern representative of *excellens*, Sm., but is

a more slender species, the first abdominal segment is much narrower and proportionately longer, the scutellum is rather less convex, the third abscissa of the radius is much longer, and the second recurrent nervure is received further from base of the third cubital cell.

Dimorphothynnus bicolor, Westw.

Enteles bicolor, Westw. Arc. Ent. ii. p. 143 (1844). ♀.

Thynnus zingerlei, D. T., Cat. Hym. viii. p. 119 (1897). ♀.

? *Rhagigaster hæmorrhoidalis*, Guér. Mag. de Zool. xii. (1842). ♂.

? *Thynnus lecheri*, D. T., Cat. Hym. viii. p. 110 (1897). ♂.

Enteles hæmorrhoidalis, Turn. Proc. Linn. Soc. N.S.W. xxxii. p. 242 (1907). ♀.

I used the name *hæmorrhoidalis* for this species in my revision of the group, probably correctly. But since that time I have received the male of *Rhagigaster castaneus*, Sm., which would fit Guérin's very brief description equally well. There can therefore be no certainty as to Guérin's species without seeing the type. *D. fimbriatus*, Sm., ♂, is a distinctly larger species.

The pair of *D. bicolor* in the British Museum is from Perth, W.A. There is a series of *D. fimbriatus* from Adelaide, S.A., and Yallingup, W.A.

Dimorphothynnus fimbriatus, Sm.

Thynnus fimbriatus, Sm. Cat. Hym. B.M. vii. p. 42 (1859). ♀.

Rhagigaster apicalis, Sm. Cat. Hym. B.M. vii. p. 63 (1859). ♂.

Thynnus ottonis, D. T., Cat. Hym. viii. p. 112 (1897). ♂.

In my revision of the Thynnidæ (Proc. Linn. Soc. N.S.W. xxxii. p. 242, 1907) I treated this species as a synonym of *D. hæmorrhoidalis*, Guér. Further material has come to hand since and shows that I was mistaken. The female *fimbriatus* differs from *bicolor*, Westw., in the shape of the head, which is shorter and much more strongly rounded posteriorly, the pronotum and scutellum are shorter; the median segment is very short, only half as long as in *bicolor*; the carinæ on the second dorsal segment are somewhat stronger; the pygidium is much narrower, being very broadly oval in *bicolor*, elongate and narrowed to the apex in *fimbriatus*, the striation of the pygidium is much coarser, and there is a tuft of long pale hairs on each side, springing from beneath the dorsal plate of the pygidium, which is absent in *bicolor*. The male *bicolor* has the enclosed triangular space on the clypeus narrower than in *fimbriatus*; the seventh dorsal segment more rounded at the apical angles,

less distinctly truncate; the second transverse cubital nervure much less oblique, which makes the second abscissa of the radius much longer than the third, not shorter as in *fimbriatus*, and the second recurrent nervure is received close to the base of the third cubital cell, distinctly closer than in *fimbriatus*. The extent of difference in these details of neuration varies individually to a certain degree. The type of *fimbriatus* from Adekaidé is identical with specimens from Yallingup, W.A.

A form from Brisbane (*Hacker*), taken in March, is probably a subspecies, the male differing in having the triangular space on the clypeus narrower; the female in the form of the sixth dorsal segment, which has the sides almost parallel.

Dimorphothynus trunciscutis, sp. n.

♂. Niger, nitidus, albo-pilosus; alis fusco-cæruleis.
Long. 16 mm.

♂. Clypeus finely punctured, thickly clothed with white pubescence; a narrow triangular area extending from the base to the apex, pointed at the base, with distinct lateral carinae, the narrow space enclosed by the carina irregularly rugose-striate. Antennæ scarcely longer than the thorax, of even thickness throughout; the interantennal prominence broad, very broadly rounded at the apex and irregularly longitudinally striated, separated from the front by a transverse carina which does not reach the eyes, from this carina an arched carina extends over the anterior ocellus enclosing an almost semicircular space. Vertex shining, finely and rather sparsely punctured. Pronotum scarcely half as long as the mesonotum, finely transversely striate-rugulose, the anterior margin raised and almost straight, the anterior angles of the prothorax acutely produced beneath. Mesonotum and scutellum shining, sparsely punctured, the dorsal surface of the scutellum flat, transverse at the apex and almost vertically truncate posteriorly; mesopleuræ coarsely punctured. Median segment shorter than the scutellum, closely punctured at the sides, sparsely in the middle, almost vertically truncate posteriorly, the dorsal surface separated from the posterior slope by a strong carina. Abdomen closely but not coarsely punctured, the segments slightly constricted at the base; first ventral segment with a strongly raised longitudinal carina which is broken before the apex so as to form an apical and a pre-apical tubercle. Seventh dorsal segment very broadly truncate at the apex, the base

coarsely punctured, the apex longitudinally rugulose. Spine of the hypopygium long and recurved. Third abscissa of the radius distinctly longer than the second, second recurrent nervure received just before one-quarter from the base of the third cubital cell.

Hab. Brisbane (*Hacker*); September.

Very nearly allied to *morio*, Westw., but may be distinguished by the colour of the legs, which are ferruginous in *morio*, by the great breadth of the scutellum at the apex, and by the much coarser sculpture of the mesopleuræ. *D. morio* is not uncommon round Sydney and has been taken by Mr. Hacker on Stradbroke Island.

Eirone subpetiolata, sp. n.

♂. Niger; mandibulis, antennis, fronte, vertice, pronoto fascia arcuata, mesonoto, scutello tegulisque pallide ferrugineis; clypeo, orbitis internis late, pronoto postscutelloque flavis; alis hyalinis, venis nigris.

Long. 8 mm.

♂. Clypeus slightly convex, truncate at the apex, without a flat triangular area; the whole head finely punctured. Antennæ rather slender, scarcely as long as the thorax and median segment combined, the apical joints feebly arcuate beneath. Ocelli in an equilateral triangle, the posterior pair more than twice as far from the eyes as from each other. Pronotum about half as long as the mesonotum; scutellum broadly rounded at the apex, the whole thorax finely punctured. Median segment rounded, very minutely punctured, almost smooth at the base, with short white pubescence on the sides and apex. Abdomen fusiform; dorsal segments 2-4 slightly depressed at the base, first segment very narrow at the base; the whole abdomen shining, minutely punctured, more coarsely on the seventh segment. Hypopygium broadly rounded and ciliated. Third abscissa of the radius half as long again as the second, first recurrent nervure received just beyond the middle of the second cubital cell, second just beyond one-third from the base of the third cubital cell.

Hab. Brisbane (*Hacker*); April.

Allied to *E. rufodorsata*, Turn., from Herberton, but differs in the colour of the head and antennæ, in the slenderer antennæ, and in the slenderer first abdominal segment, also in the shorter second abscissa of the radius.

Family *Psammocharidæ*.*Batozonus tricolor*, Sm.*Pompilus tricolor*, Sm. Trans. Ent. Soc. London, p. 242 (1868). ♂.*Pompilus trichrous*, D. T., Cat. Hym. viii. p. 327 (1897). ♂.

♀. Nigra; capite, antennis, segmentis abdominis quatuor analibus, segmento dorsali secundo vel toto vel dimidio basali, femoribus anticis, tibiis tarsisque aurantiacis; alis aurantiacis, apice infumatis, venis testaceis.

Long. 20-24 mm.

♀. Clypeus transverse at the apex, closely and minutely punctured, with a few larger punctures intermingled, the apex of the labrum exposed. Second joint of the flagellum nearly half as long again as the third; eyes separated on the vertex by a distance equal to the length of the third joint of the flagellum. Pronotum broadly arched posteriorly, not angulate; scutellum strongly convex. Median segment longer than the apical breadth, without sulcus or striæ, clothed with short fuscous hairs. Sixth dorsal segment punctured, sparsely clothed with long black hairs. Basal joint of fore tarsus with three spines; ungues of the fore tarsi bifid, of the intermediate and hind tarsi unidentate. Second abscissa of the radius nearly half as long again as the third, the first recurrent nervure received beyond three-quarters from the base of the second cubital cell, second a little beyond the middle of the third cubital cell. Cubitus of the hind wing originating at a distance before the transverse median nervure equal to about three-quarters of the length of the third abscissa of the radius. The fuscous apical margin of the wing does not extend to the third transverse cubital nervure.

Hab. Adelaide, S.A. (*Smith*), ♂; Mackay, Q. (*Turner*), ♀; Townsville, Q. (*Dodd*), ♀.

The sexes are exceedingly different, as is usual in this genus, but the neuration is similar. This is the Australian representative of the Indian *B. unifasciatus*, Sm., from which it differs in the colour of the thorax and abdomen, and in the slenderer median segment of both sexes, also in the longer second joint of the flagellum in the male. The group, which includes *B. fuliginosus* Klug, and *B. malecassus*, Sauss., is distinguished from other species of the genus by the great distance between the cubitus and transverse median nervure of the hind wing.

Batozonus vespoïdes, Sm.

Pompilus vespoïdes, Sm. Trans. Ent. Soc. London, p. 244 (1868). ♀.

♂. Niger; clypeo, orbitis internis late, pronoto, tegulis, scutello macula quadrata, postscutello macula, segmento dorsali primo macula parva utrinque, segmentis dorsalibus 2-7 fascia lata transversa utrinque pallide flavis; antennis basi et subtus pedibusque ferrugineis, tibiis tarsisque posticis nigris; alis hyalinis, apice extremo pallido infumatis, venis nigris.

Long. 11-15 mm.

♂. Clypeus transverse at the apex, the labrum exerted. Antennæ stout, the joints moderately arcuate beneath, but less strongly so than in *tricolor*, second joint of the flagellum distinctly shorter than the third. Pronotum strongly rounded at the anterior angles, the posterior margin widely arched. Median segment broader than long, clothed with thin white pubescence. Seventh dorsal segment narrowly truncate at the apex. Second abscissa of the radius twice as long as the third, first recurrent nervure received at two-thirds from the base of the second cubital cell, second close to the middle of the third cubital cell. Cubitus of the hind wing originating just before the transverse median nervure. All the tarsal ungues bifid.

Hab. Mackay and Cairns, Q. (*Turner*); Brisbane, Q. (*Hucker*); Victoria (*French*).

This is the Australian representative of the group of the European *B. quadripunctatus*, Fabr., and is nearest to the Asiatic *B. orientalis*, Cam., the female of which has been described by Bingham under the name *bioculatus*. In the Oriental region a dark-winged form of the female occurs, named by Bingham *bracatus*, but I do not believe that any corresponding aberration occurs in Australia. The species is common in Queensland, but I never guessed the connection of the sexes during my residence there. *B. tricolor* seems to be a rare species. As far as I know these are the only two Australian species of *Batozonus*.

Aporoïdeus ultimus, sp. n.

♀. Nigra; clypeo linea transversa subapicali, fronteque macula parva utrinque flavidulis; mandibulis basi, femoribus, tibiis, tarsisque subtus ferrugineis; pronoto marginibus indistincte albidis; alis sordide hyalinis, venis nigris.

Long. 5 mm.

♀. Clypeus shallowly emarginate at the apex, the labrum not exposed; second joint of the flagellum half as long again

as the third; eyes converging a little towards the vertex; head finely and closely punctured, front with a distinct longitudinal sulcus. Pronotum short and broad; parapsidal furrows very indistinct; scutellum longer than broad. Median segment shorter than the pronotum, obliquely sloped posteriorly, with an almost obsolete median sulcus. Thorax and median segment subopaque; abdomen shining, almost smooth. Hind tibiæ with three or four fairly long spines on the outer margin; fore tarsi without a comb, with only a few very minute spines beneath the first joint; tarsal ungues with a small tooth near the middle. Second abscissa of the radius about equal to the third; first recurrent nervure received just beyond two-thirds from the base of the second cubital cell, second at the middle of the third cubital cell. Submedian cell a little longer than the median; cubitus of the hind wing originating distinctly beyond the transverse median nervure.

♂. Without the whitish band on the clypeus, the spots on the inner margin of the eyes very minute, the apical dorsal segment and a spot at the base of the hind tibiæ white. Pronotum entirely black.

Clypeus subtruncate at the apex; first recurrent nervure received close to the middle of the second cubital cell; fore tarsi smooth. Antennæ stout, the joints not arcuate beneath, the second joint of the flagellum no longer than the third.

Length 4 mm.

Hab. Eaglehawk Neck; February, 1 ♀. Mt. Wellington, 2200 ft.; January, 1 ♂.

The ♀ is the type.

This is very nearly allied to the European *A. cinctellus*, Lind., from which it differs in the longer second joint of the flagellum, the less distinct sulcus on the median segment, the longer third abscissa of the radius, the absence of the yellowish spots on the hind margin of the pronotum, and the very slightly longer submedian cell of the fore wing. The male *cinctellus* has the legs without ferruginous colour.

A colour-variety taken by me at Yallingup, S.W. Australia, has the clypeus of the female black, the frontal spots almost obsolete, and the pronotum entirely black. A male taken in the same locality is black, with the middle of the hind femora ferruginous and a white spot at the base of the hind tibiæ.

Aporus hilli, sp. n.

♀. Nigra; clypeo, fronte sub antennis, genis, postscutello, segmento mediano fascia transversa basali et apicali, segmento

dorsali primo macula magna basali, segmentis dorsalibus basali-
busque 1-5 fascia lata apicali, segmento dorsali sexto lateribus,
mesopleuris fascia, coxis, trochanteribus, femoribus subtus, tibiis
supra tarsisque supra dense albido-pilosis; orbitis internis
supra antennis late, capite margine posteriore, pronoto utrinque
nigro-maculato, mesonoto maculis duabus margine posteriore
scutelloque macula dense aureo-pilosis; alis fusco-hyalinis, apice
late infumatis.

Long. 11 mm.

♀. Clypeus broad, truncate at the apex. Eyes almost
parallel on the inner margin, separated on the vertex by a
distance about equal to the length of the second joint of the
flagellum; posterior ocelli as far from each other as from
the eyes. Front rather flat; second joint of the flagellum
as long as the first and third combined. Pronotum in the
middle a little shorter than the mesonotum; the posterior
margin arched, not angulate. Median segment much broader
than long, the posterior slope oblique, a longitudinal sulcus
on the dorsal surface. Fore tarsi with a long comb, the
spines more or less spatulate, the basal joint with four spines.
Tarsal ungues with one tooth near the middle; hind tibiæ
spinose. Second abscissa of the radius a little shorter than
the first; second cubital cell receiving both recurrent
nervures, the first a little before the middle, the second
just before the apex. Cubitus of the hind wing interstitial
with the transverse median nervure.

Hab. Port Darwin, N.T. (*Hill*); May.

The markings consist of short hairs laid very flat and close,
much as in "*Pompilus*" *labilis*, Sm., from which the
neururation differs conspicuously, through the absence of a
third cubital cell. The structure is very similar to that of
A. cingulatus, Fabr., also the shape of the second cubital
cell.

Family Crabronidæ.

Zoyphium flavofusciatum, sp. n.

♂. Niger, opacus; mandibulis, labro, clypeo apice, flagello, pro-
noto, tegulis, scutello, postscutello, segmentis abdominalibus
primo, quinto, sexto septimoque, femoribus apice, tibiis tarsisque
brunneo-ferrugineis; mesopleuris segmentoque mediano apice
obscure ferrugineis; clypeo, apice excepto, scapo, pronoto fascia
utrinque, segmentoque dorsali primo fascia undulata utrinque
flavis; segmentis dorsalibus quinto sextoque fascia utrinque
obscure flavidula; alis hyalinis, venis fuscis, costa stigmatique
ferrugineis.

Long. 7.5 mm.

♂. Mandibles deeply notched on the lower margin; clypeus flattened, truncate at the apex, the apical margin narrowly depressed, more broadly in the middle than at the sides, a small tooth on each side of the depressed apical margin. Face clothed with golden pubescence; antennæ twelve-jointed, the joints gradually thickened towards the apex, joints 8-11 broader than long, apical joint very large and stout, blunt at the apex. Posterior ocelli twice as far from each other as from the eyes. Median segment clothed with fine pale golden pubescence on the sides and apex, the dorsal surface with a rather broad longitudinal sulcus. Abdomen fusiform, the second segment the broadest, apical segment produced into a blunt point with a small spine on each side. The whole insect very closely microscopically punctured. Third abscissa of the radius distinctly shorter than the second transverse cubital nervure, first recurrent nervure received very distinctly before the apex of the first cubital cell, second beyond the middle of the second cubital cell.

Hab. Brisbane (*Hacker*); November.

Very distinct in colouring from any other species of the genus; the club of the antennæ is much stouter than in *rufonigrum* and *erythrosoma*, but apparently more conical than in *crassicorne*, Ckll.

Pison (Parapison) exclusum, sp. n.

♂. Niger, opacus; antennis articulis quinque basalibus, tegulis pedibusque ferrugineis; segmentis dorsalibus, secundo excepto, apice pallide bruneis et pallide aureo-sericeis; alis sordide hyalinis, venis nigris.

Long. 8 mm.

♂. Clypeus feebly bilobed at the apex, covered with pale golden pubescence which extends on to the front. Antennæ short and stout, the second joint of the flagellum a little longer than the third, joints 6-11 broader than long. The whole insect closely microscopically punctured, a distinct frontal longitudinal groove reaching the anterior ocellus; posterior ocelli farther from each other than from the anterior ocellus and a little farther from each other than from the eyes. Median segment with a distinct longitudinal groove, in which lies a low carina, a transverse groove at the base of the segment, the remainder of the dorsal surface very finely granulate. Abdomen sessile, short and broad; seventh dorsal segment truncate at the apex. Second abscissa of the radius a little more than half as long as

the first, second recurrent nervure received just beyond one-fourth from the base of the second cubital cell, a little further from the first transverse cubital nervure than is the first recurrent nervure.

Hab. Brisbane (*Hacker*): November.

Apart from the neurulation this strongly resembles the male of *Pison vestitum*, Sm., but the clypeus is quite different and the abdomen more sessile, the antennæ shorter with the joints differently proportioned, the punctures less distinct, and the distance between the eyes on the vertex greater.

Key to the Genera of Australian Pemphredoninæ.

♀ ♀.

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| 1. Three cubital cells; antennæ inserted on the front far above the base of the clypeus | <i>Neofoxia</i> . |
| Two cubital cells; antennæ inserted low down, on the sides of or at the base of the clypeus . . | 2. |
| 2. Two recurrent nervures | <i>Passalæcus</i> . |
| One recurrent nervure | 3. |
| 3. Abdomen petiolate; hind tibiæ with short spines on the outer margin | <i>Paracrabro</i> . |
| Abdomen not petiolate; hind tibiæ without spines | 4. |
| 4. Ventral plate of the apical segment produced into a stout spine-like process; abdomen ferruginous. Ventral plate of the apical segment not produced | <i>Harpactophilus</i> . |
| 5. Pronotum with a distinct transverse dorsal surface | 5. |
| Pronotum oblique, without a distinct dorsal surface | <i>Austrostigmus</i> . |
| | <i>Spilomena</i> . |

Key to the Australian Species of *Neofoxia*.

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| 1. Thorax yellow, with a quadrate black spot on the mesonotum; abdomen pale testaceous brown; head black | <i>N. interstitialis</i> , Cam. |
| Black; scutellum and postscutellum marked with yellow | <i>N. scutellatus</i> , Turn. |

These species were described as *Psenulus*. *Psen lutescens*, Turn., is a synonym of *interstitialis*, Cam., which was described from a New Guinea specimen. Both the Australian species are from North Queensland.

Genus PASSALÆCUS.

I do not think that *Polemistus*, Sauss., can be separated from this genus. The only Australian species is *P. exul*, Turn., which occurs on the whole eastern coast of Queensland.

Genus PARACRABRO.

The only representative of this genus is *P. froggatti*, Turn., a Victorian species. The genus is nearly allied to the wide-ranging genus *Stigmus*.

Key to the Species of Harpactophilus.

♀ ♀.

1. Pronotum with a distinct transverse dorsal surface, the angles sharply produced; front yellow *H. tricolor*, Turn.
 Pronotum without a distinct dorsal surface; front black 2.
2. The carina between the antennæ produced at the apex in the form of a ploughshare, overhanging the base of the clypeus; recurrent nervure received distinctly before the first transverse cubital nervure .. *H. arator*, Turn.
 The frontal carina low, not produced at the apex; recurrent nervure interstitial, or very nearly so, with the first transverse cubital nervure 3.
3. Eyes separated from the posterior margin of the head by a space exceeding twice the distance between the posterior ocelli 4.
 Eyes separated from the posterior margin of the head by a distance scarcely exceeding the distance between the posterior ocelli 5.
4. Vertex rugose, mesonotum punctured; wings hyaline, second cubital cell pointed on the radius *H. kohlii*, Turn.
 Vertex and mesonotum longitudinally striated; wings fusco-hyaline, second cubital cell not pointed *H. sulcatus*, Turn.
5. Wings dark fusco-hyaline, second abscissa of the radius half as long as the first *H. bicolor*, Sm.
 Wings hyaline, first abscissa of the radius about three times as long as the second .. *H. steindachneri*, Kohl.

The genus *Harpactophilus* is confined to the Australian and Austro-Malay region, all the known species being from the Queensland coast, except *H. bicolor*, the type of the genus, which is from Mysol. *H. steindachneri* seems to be the Australian representative of *bicolor*, probably a geographical race.

Key to the Australian Species of Spilomena.

1. Testaceous brown, the head black *S. australis*, Turn.
 Black; legs, antennæ, mandibles, and tegulæ testaceous brown 2.

2. Recurrent nervure interstitial with the first transverse cubital nervure; wings strongly iridescent *S. iridescens*, Turn.
 Recurrent nervure received before the first transverse cubital nervure; wings only slightly iridescent 3.
3. Second abscissa of the radius longer than the first transverse cubital nervure; head almost smooth 4.
 Second abscissa of the radius much shorter than the first transverse cubital nervure; head longitudinally striated *S. longiceps*, Turn.
4. Length 5 mm. Distance between recurrent nervure and first transverse cubital nervure equal to half the length of the latter nervure *S. hobartia*, Turn.
 Length 2 mm. Recurrent nervure received very close to the apex of the first cubital cell. *S. elegantula*, Turn.

Spilomena is very near *Austrostigmus* in some of the species, especially in *S. longiceps*. The absence of the groove in front of the mesopleuræ for the reception of the anterior femora does not seem to be a very satisfactory generic distinction in the group, the degree of development showing much variation in the different species. The genus has a wide range in Australia, being recorded from N. Queensland, Tasmania, and S.W. Australia.

Key to the Species of *Austrostigmus*.

1. Pronotum ferruginous red *A. ruficollis*, Turn.
 Pronotum black 2.
2. Mesonotum almost smooth 3.
 Mesonotum rugose or coarsely reticulate 5.
3. Second cubital cell pointed on the radius *A. queenslandensis*, Turn.
 Second cubital cell not pointed on the radius 4.
4. Second abscissa of the radius as long as the second transverse cubital nervure; stigma fuscous *A. glabrellus*, Turn.
 Second abscissa of the radius scarcely more than half as long as the second transverse cubital nervure; stigma pale testaceous *A. approximatus*, Turn.
5. Mesonotum coarsely reticulate *A. reticulatus*, Turn.
 Mesonotum rather finely rugose *A. dubius*, Turn.

The genus has a wide range, being recorded from North Queensland and S.W. Australia; I have also seen specimens of *A. reticulatus* from Port Darwin, N.T. The species utilise small deserted beetle-holes in dead trees for nesting-purposes.

Austrostigmus dubius, sp. n.

♀. Nigra; mandibulis, antennis, tegulis pedibusque brunco-testaceis; alis hyalinis, venis testaceis; mesonoto rugoso.
Long. 4 mm.

♀. Head longer than broad, with a carina from the anterior ocellus to the base of the clypeus, the carinæ round the eyes strongly developed, the front between the carinæ punctured-rugulose. Eyes divergent toward the clypeus; posterior ocelli as near to the eyes as to each other. Antennæ inserted on each side of the clypeus, nearer to the base than to the apex, farther from each other than from the eyes, as long as the head, the flagellum more than twice as long as the scape. Pronotum transverse, pointed at the angles; mesonotum rugulose; scutellum smooth, opaque; mesopleuræ opaque, with a few scattered punctures. Enclosed area of the median segment well defined, almost triangular, the marginal carinæ not quite meeting at the apex, with two longitudinal carinæ near the middle, the space between the carinæ transversely striated; the surface of the posterior truncation indistinctly transversely striated, with a fovea at the base. Abdomen smooth and shining, the sixth segment without a pygidial area. Second cubital cell very small, the second abscissa of the radius less than half as long as the first, second cubital cell less than half as long on the radius as on the cubitus, the length on the cubitus equal to about half the length of the first transverse cubital nervure; the recurrent nervure received at a distance before the apex of the first cubital cell slightly exceeding the length of the cubital margin of the second cubital cell.

Hab. Kuranda, N. Queensland (*Turner*); June.

This is very near *A. queenslandensis*, Turn., but differs in the much coarser sculpture of the mesonotum, being intermediate in this respect between *queenslandensis* and *reticulatus*. The second cubital cell in *queenslandensis* is triangular.

Austrostigmus approximatus, sp. n.

♀. Nigra; antennis, tegulis pedibusque brunco-testaceis; mandibulis basi flavis, apice ferrugineis; alis pallide flavo-hyalinis, venis pallide testaceis.
Long. 4 mm.

♀. Head longer than the greatest breadth, finely shagreened, with a carina reaching from the anterior ocellus to the base of the clypeus, and continued to the apex of the clypeus in a gradually broadening form. Mandibles acutely

bidentate at the apex. Antennæ inserted as far from each other as from the eyes, shorter than the head, the flagellum a little more than twice as long as the scape. Eyes elongate-ovate, not quite reaching the base of the mandibles, distinctly divergent towards the clypeus, the carina round the margin of the eyes rather indistinct. Posterior ocelli farther from the eyes than from each other, and about twice as far from the posterior margin of the head as from the eyes. Pronotum short, transverse, the anterior margin raised, the angles sharply pointed; the tubercles of the prothorax reaching the tegulæ. Mesonotum opaque, closely and microscopically punctured; scutellum subopaque, with a transverse groove at the base. Dorsal surface of the median segment almost entirely occupied by the enclosed area, which is strongly reticulate, with two or three distinct longitudinal carinæ, the segment abruptly truncate posteriorly, the surface of the truncation opaque, with a longitudinal carina near the apex. Abdomen subpetiolate, fusiform, smooth and shining; the sixth dorsal segment finely punctured, without a pygidial area. Second cubital cell twice as long on the cubitus as on the radius: first abscissa of the radius a little longer than the second; recurrent nervure received by the first cubital cell at a distance before the apex equal to the length of the second abscissa of the radius; stigma more than twice as long as the greatest breadth.

Hab. Kuranda, N. Queensland (Turner); May.

Differs from *A. reticulatus*, Turn., conspicuously in the sculpture of the mesonotum, in the much longer head, the shape of the second cubital cell, and in the finer sculpture of the head and median segment. From *queenslandensis*, Turn., it differs markedly in the sculpture of the head, the greater length of the head behind the eyes, and in the much larger second cubital cell. The legs in this genus are unarmed as in *Spilomena*, from which it differs in the structure of the pronotum.

Austrostigmus glabrellus, sp. n.

♀. Nigra; mandibulis, antennis, tegulis pedibusque testaceis; alis hyalinis, venis fusco-ferrugineis.

Long. 3 mm.

♀. Head a little longer than the greatest breadth, opaque and almost smooth, the orbital carinæ developed on the outer margin of the eye only; the frontal carina almost obsolete and not reaching the anterior ocellus. Eyes diverging towards the clypeus, almost touching the base of the mandibles.

Antennæ inserted on the sides of the clypeus, a little nearer to the base than to the apex, shorter than the head, the flagellum more than twice as long as the scape. Posterior ocelli much nearer to each other than to the eyes. Pronotum very short, transverse, the angles acute; mesonotum opaque, the parapsidal furrows distinct, but very shallow; scutellum subopaque, with a transverse groove at the base; pleuræ almost smooth. Median segment rather coarsely reticulate, the enclosed area well marked, with two rather low longitudinal carinæ near the middle. Abdomen smooth and shining. Second abscissa of the radius a little shorter than the first, equal to the second transverse cubital nervure; second cubital cell less than half as long again on the cubitus as on the radius; recurrent nervure received at a distance before the apex of the first cubital cell equal to about half the length of the first abscissa of the radius.

Hab. Kalamunda, Darling Ranges, S.W. Australia (Turner); March.

This species is nearest to *A. approximatus* in the sculpture, but is a smaller species, with the head less massive, the nervures darker, and the second cubital cell much longer.

Austrostigmus rujicollis, sp. n.

♀. Nigra; scapo tegulisque bruno-testaceis; prothorace rufoferrugineo; femoribus apice, tibiis basi, tarsisque luteis; alis hyalinis, venis pallidis, stigmatibus fusco.

Long. 3 mm.

♀. Head scarcely longer than the greatest breadth; the front obliquely striated, with a carina from the base of the clypeus not quite reaching the anterior ocellus. Eyes strongly divergent towards the clypeus, not quite reaching to the base of the mandibles, or to the posterior margin of the head. Posterior ocelli as near to the eyes as to each other; the carina round the eyes well marked. Antennæ inserted nearer to the eyes than to each other, a little longer than the head, the scape about half as long as the flagellum. Pronotum transverse, crenulate, the anterior angles pointed; mesonotum granulate. Median segment very long, much longer than broad, reticulate, the enclosed area triangular, with a median longitudinal carina. Abdomen subpetiolate, elongate, smooth and shining, the sixth segment without a pygidial area. Second cubital cell rather more than half as long on the radius as on the cubitus; the first transverse cubital nervure a little longer than the second abscissa of the radius, about equal in length to the first abscissa of the radius: stigma about twice as long as the greatest breadth.

Hab. Kuranda, N. Queensland (*Turner*); June 26, 1913.

Easily distinguished from other species of the genus by the colour of the pronotum and legs and by the sculpture of the front. As in other species of the genus, there is a transverse crenulate groove at the base of the scutellum.

Spilomena longiceps, sp. n.

♀. Nigra; mandibulis, antennis pedibusque brunco-testaceis; alis hyalinis, venis tegulisque testaceis.
Long. 4 mm.

♀. Head very long, about one-third longer than the greatest breadth; eyes slightly divergent towards the clypeus, very long, elongate-ovate, not quite reaching to the base of the mandibles; the whole head rather finely longitudinally striate, with a low carina from the anterior ocellus to the base of the clypeus and continued on the clypeus to the apex. Antennæ shorter than the head, the scape about half as long as the flagellum. Posterior ocelli nearly twice as far from the eyes as from each other, farther from the posterior margin of the head than from the eyes. Pronotum very small, sunk far below the mesonotum and almost vertical, the dorsal surface not developed and without sharp angles. The tubercles of the prothorax reach the tegulae. Mesonotum opaque, closely and minutely punctured, nearly twice as broad as long; scutellum smooth, opaque, with a depressed, crenulate, transverse line at the base. Basal area of the median segment well defined, large, broadly rounded at the apex, longitudinally striated, the striæ diverging towards the apex, with small transverse striæ giving a reticulate appearance; outside the enclosed space are rather indistinct oblique striæ. Abdomen subpetiolate, smooth and shining. Fore tarsi without a comb, tibiæ without spines on the outer margin. Two cubital cells, the second more than half as broad on the radius as on the cubitus; first abscissa of the radius nearly half as long again as the second, the recurrent nervure received just before the apex of the first cubital cell. Stigma more than twice as long as the greatest breadth.

Hab. Kuranda, N. Queensland (*Turner*); May.

This species is very near the genus *Austrostigmus*, differing chiefly in the strongly depressed pronotum, which shows no transverse dorsal surface, as in that genus. The characters of the head are nearer to *Austrostigmus* than to *Spilomena*.

Spilomena iridescens, sp. n.

♀. Nigra; mandibulis tegulisque flavo-luteis; antennis pedibusque bruno-ferrugineis; alis hyalinis, valde iridescentibus, venis fusco-ferrugineis.

Long. 3 mm.

♀. Head much broader than long, broadly rounded behind the eyes; subopaque, microscopically punctured, the frontal carina very short, only extending a short distance from the base of the clypeus; antennæ inserted very low down, on each side of the clypeus near the apex, nearer to the eyes than to each other, the flagellum about twice as long as the scape. Posterior ocelli nearly twice as far from the eyes as from each other; very little farther from the posterior margin of the head than from each other. Pronotum very small, depressed below the mesonotum, obliquely sloped, the tubercles of the prothorax touching the tegulae. Mesonotum and scutellum subopaque, minutely punctured, a transverse crenulate groove at the base of the scutellum. Median segment about as long as the mesonotum, slightly narrowed to the apex, the enclosed area well defined, with two longitudinal carinæ near the middle, the space between the carinæ and the space between them and the marginal carinæ transversely striated. Mesopleuræ minutely punctured, sides of the median segment rugose. Abdomen shining, minutely punctured, sixth dorsal segment without a pygidial area. First abscissa of the radius very short; second cubital cell much longer than broad, almost as long on the radius as on the cubitus, the recurrent nervure interstitial with the first transverse cubital nervure.

Hab. Yallingup, S.W. Australia (*Turner*); October.

This species has the inner margin of the eyes almost parallel, only slightly divergent towards the clypeus. The head is shorter and broader than in other Australian species of the genus, and the position of the recurrent nervure is different.

Spilomena elegantula, sp. n.

♀. Nigra; mandibulis, antennis, tegulis pedibusque brunco-testaceis; alis hyalinis, venis pallide testaceis, stigmatibus infumato.

Long. 2 mm.

♀. Head distinctly longer than the greatest breadth, smooth and subopaque. Eyes almost parallel on the inner margin, touching the base of the mandibles; posterior ocelli far apart, farther from each other than from the eyes, as far

from the posterior margin of the head as from each other. Antennæ much shorter than the head, inserted low down close to the apex of the clypeus. A short, almost obsolete, longitudinal sulcus below the anterior ocellus. Pronotum narrow, depressed, and obliquely sloped; mesonotum narrower than the head, opaque; scutellum subopaque, with a transverse groove at the base. Median segment almost as broad as long, reticulate; the enclosed area not clearly defined, the marginal carinæ being very far apart and merging into the margin of the segment before the apex, two short carinæ from the base not reaching the middle, about twice as far from the marginal carinæ as from each other. Abdomen smooth and shining. Second abscissa of the radius more than twice as long as the first, and about twice as long as the first transverse cubital nervure, a little shorter than the cubital margin of the second cubital cell; recurrent nervure received close to the apex of the first cubital cell. Stigma less than twice as long as broad.

Hab. Kuranda, N. Queensland (*Turner*); May.

This is the smallest Australian fossorial wasp which I have seen. I took it from the calyx of a blossom of *Eugenia*. The second cubital cell is much longer than in other species of the genus.

All the types of the species described in this paper are in the British Museum. For the Brisbane species collected by Mr. Hacker I am indebted to Dr. Hamlyn-Harris, of the Queensland Museum.

VI.—*The Porcupine of Tenasserim and Southern Siam.*

By OLDFIELD THOMAS.

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THE National Museum owes to Mr. C. Boden Kloss a first typical set of the fine collection of mammals from S.E. Siam, of which he has been giving an account to the Zoological Society. Among these there is a Porcupine, which for want of material for comparison he has asked me to work out for him, and I have at the same time examined the other specimens that the Museum contains from the same region.

Porcupines from the Burma-Siam area have been some-